



United States  
Department of  
Agriculture

Forest  
Service

Southwestern  
Region



# **Record of Decision for Proposed Magdalena Ridge Observatory Final Environmental Impact Statement**



**Cibola National Forest  
Socorro County, New Mexico**

**December 2003**



Cover: View of some existing facilities, FS road 235 and South Baldy Peak looking west from the Langmuir Laboratory.

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# **RECORD OF DECISION**

## **MAGDALENA RIDGE OBSERVATORY**

### **1.0 Decision and Reasons for the Decision** \_\_\_\_\_

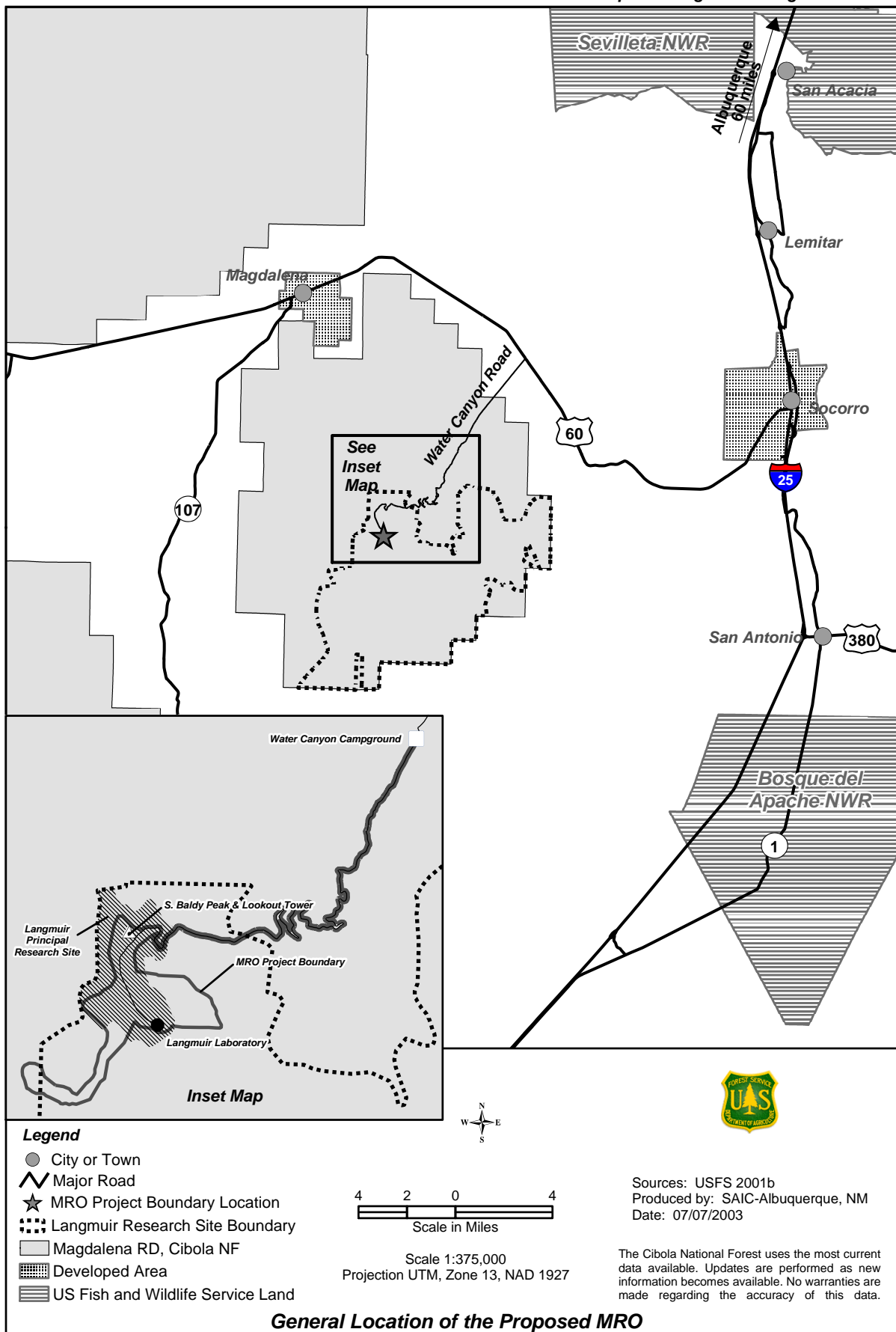
#### **1.1 Background**

The proposed Magdalena Ridge Observatory (MRO) project started with initial discussions among potential collaborators in 1995. New Mexico Institute of Mining and Technology (NMIMT) and U.S. Army staff visited the site to determine its general feasibility. In 1996 and 1997, the U.S. Air Force, New Mexico State University, and the University of Puerto Rico joined the consortium, and atmospheric testing on the site was begun to determine if it was competitive with other southwestern sites. The first formal consortium meeting was held at the University of Puerto Rico in 1997. Late in the year, New Mexico Highlands University joined the consortium. Two consortium meetings were held in 1999, and a design and engineering firm was retained to develop a conceptual design of the facility. In 2001, sponsorship of the project was transferred to the U.S. Navy, Naval Research Laboratory (NRL). The University of Cambridge has joined the consortium in 2002. A conceptual layout of the facilities was then developed in 2002.

The proposed site for the MRO facilities is within the existing Langmuir Research Site, a 31,000-acre area set aside by Congress in 1980, under Public Law (P.L.) 96-550, within the Cibola National Forest, New Mexico (see map on page 2 of ROD). Within the Langmuir Research Site is a 1,000-acre area designated by Congress as the “Principle Research Facility” (PRF). The major portion of the 980-acre proposed MRO project area, containing the proposed facilities, would also be located in the PRF area. However, portions of the proposed MRO project area along Water Canyon Road and part of the utility corridor, specifically the electrical and communication utilities would be located outside the PRF area.

The Langmuir Research Site was established to encourage scientific research into atmospheric processes and astronomical phenomena. The proposed observatory would feature both a conventional telescope and an Interferometer Array of telescopes that function together to provide higher resolution than that which is available from a single telescope. This innovative technology has been pioneered by the NRL at the Navy Prototype Optical Interferometer (NPOI) near Flagstaff, Arizona. Experience from developing NPOI was applied to this proposed facility with further refinements to improve capabilities for high-resolution observations.

Currently, the Langmuir Research Site operates under an existing Special Use Permit (SUP) from the Cibola Forest Service as a scientific research facility pursuant to Public Law 96-550 (see pages 1-3 in the FEIS for more detailed information).





The Proposed Magdalena Ridge Observatory's primary purpose will be astronomical and optical research and education by NMIMT and the other consortium members. A secondary purpose will be to support White Sands Missile Range (WSMR) with passive observing techniques for identifying satellites and tracking missiles during tests. The facility would provide a location for state-of-the-art telescopes, cameras, spectrometers, and associated equipment. The proposed facilities will also assist in fulfilling the need for high-tech education in New Mexico, where the economy is closely tied to science and engineering.

The proposed MRO will serve the academic research community by providing telescopes for research and development of research techniques. This is important and timely due to the closing of several research telescopes at other observatories which has limited the research community. The observatory will also provide public outreach programs for K-12 students, courses for K-12 teachers, research experience for undergraduates and support of research by graduate students.

The Final Environmental Impact Statement (EIS) documents the analysis of four alternatives, including a No Action alternative, to meet these needs.

## **1.2 Decision**

Based upon my review of all alternatives and comments received, I have decided to implement Alternative 3 and Utility Option 3. With this decision, I am authorizing the modification of the existing Special Use Permit (SUP), (permit number MAG61), that was given to New Mexico Institute of Mining and Technology (NMIMT) for the establishment and operation of the Langmuir Research Site pursuant to Public Law 96-550. This modification of Special Use Permit number MAG61, as defined by Alternative 3 and Utility Option 3, gives NMIMT authorization to construct and operate an interferometer array and its associated infrastructure, within the Principle Research Facility area of the Langmuir Research Site on Magdalena Ridge of the Magdalena Ranger District, Cibola National Forest, Socorro County New Mexico.

The following information is a brief description of Alternative 3 and Utility Option 3. For more detailed information, see Chapter 2, pages 2-1 to 2-18 in the FEIS. Implementation of Alternative 3 and Utility Option 3 will consist of the construction and operation of:

- An interferometer array.
- A large telescope pair.
- A single stand alone telescope.
- Seven support buildings including the operation center.
- An electrical sub station.
- A temporary storage structure.
- Water storage tanks.
- An avalanche winch and cable.
- Road maintenances, repair and realignment.
- A new water line from the existing water line on the ridge next to the Langmuir Laboratory to the MRO facilities.

- A distribution water pipe buried within the existing Water Canyon Road roadbed on the ridge.

All facilities will be located on Magdalena Ridge within the PRF area. See page 2-17 of the FEIS for a map of the location.

In response to issues concerning ground disturbance, changes in visual quality and wildlife habitat, raised by the public during scoping (see pages 1-7 of FEIS), NMIMT and the Forest Service identified a location for the Operations Center and main cluster of support facilities farther south on the ridge and closer to the Interferometer Array. This became the site location for Alternative 3. The site also turned out to be flatter and less visible from off-site locations. Construction in this location requires less excavation, decreasing the amount of ground and wildlife habitat disturbed. This location also improves operational efficiency for the scientific and research activities.

The construction process and operational phase for Alternative 3 and Utility Option 3 will be the same as described in Chapter 2, pages 2-1 to 2-16 in the FEIS. The electric and communication lines will use the existing lines and power poles that will be upgraded per Socorro Electric's requirements. These lines will be buried in the road bed and along existing utility corridors on the ridge top as described on pages 2-7 in the FEIS. Utility Option 3 would provide water from the existing surface water impoundment in the East Fork of Sawmill Canyon that currently supplies Langmuir Laboratory (see pages 2-8 to 2-10 in FEIS for location and more detailed descriptions). To minimize ground disturbance, the water pipe conveying the water and the 80-gauge steel conduit for the electrical cable for the water pump, would both be placed on the ground surface.

All applicable construction, water, air and waste permits (see pages 3-5 to 3-7 of FEIS) will be obtained by NMIMT pursuant to all local, state and federal requirements in addition to compliance with the modified SUP and Annual Operation and Maintenance Plan for the Langmuir Research Site.

When compared to the other alternatives, Alternative 3 and Utility Option 3 will:

- Meet the purpose of providing astronomical and optical research and education opportunities.
- Fill the need for high-tech education in New Mexico where the economy is closely tied to science and engineering.
- Be more responsive to issues relating to visual, wildlife, water and disturbance concerns raised by the public during the scoping and Draft Environmental Impact Statement (DEIS) comment period.
- Be less visible from off-site locations.
- Require less excavation, decreasing the amount of ground and wildlife habitat disturbance.
- Improve operational efficiency for the proposed MRO scientific and research activities.
- Utilize an existing permitted water source that will be supplemented with water hauled from an off site location, thus eliminating the need to remove more water from the watershed.
- Provide compliance with State Historic Preservation regulations.

- Provide compliance with the Threatened and Endangered Species Act. (see the Biological Opinion, in the project record and as discussed on pages 3-113 to 3-132 in the FEIS).
- Provides compliance with Executive Order (EO) 13186 for Neotropical Migratory Birds. (see pages 3-313 to 3-132 in the FEIS and Neotropical Migratory Bird Analysis report in the project record for more details).

All practical means to avoid or minimize environmental harm from the decision have been adopted as outlined in the mitigation section in Chapter 2, pages 2-40 to 2-46 of the FEIS and Appendix A of the ROD. This alternative meets requirements under the Clean Air Act, Taylor Grazing Act, Migratory Bird Treaty Act of 1918, Fish and Wildlife Coordination Act of 1958 (P.L. 83-654, Section 401 and 404 of the FWPCA of 1982 etc. (see pages 3-5 to 3-7 in FEIS for complete list).

### **1.3 Other Alternatives Considered**

In addition to the selected alternative, I considered three other alternatives, which are discussed below. Alternative 3 and Utility Option 3 were the environmentally preferred alternatives based on the analysis of the direct, indirect and cumulative impacts to water, wildlife habitat, changes in visual quality and soil disturbance. A more detailed comparison of these alternatives can be found in the FEIS on pages 2-22 to 2-39.

#### ***Alternative 1 - Proposed Action***

The Proposed Action included an Interferometer Support Facility and the location of the Operations Center being closer to South Baldy Peak, than those facilities identified under Alternative 3. The majority of the facilities would be located closer to South Baldy Peak than those in Alternative 3 but farther away than those described in Alternative 4.

All three utility options described in the FEIS were considered with Utility Option 1 being the preferred for this alternative. While the location of some facilities would differ, the construction process and operational phase under this alternative would be the same as all other alternatives except Alternative 2. See pages 2-1 to 2-16 of the FEIS for a full description of the facilities and location.

#### ***Alternative 2 - No Action***

Under the No Action alternative, current management plans would continue to guide management of the project area. Under the No Action Alternative, no MRO construction would be undertaken. Ongoing use of the Langmuir Research Site would continue, as would Forest Service management activities and Forest uses such as recreation. Water Canyon Road would be maintained and repaired in accordance with the Langmuir Laboratory SUP and Annual Operations and Maintenance Plan. See page 2-16 of the FEIS for a full description.

#### ***Alternative 4***

Alternative 4 was developed in response to public concerns about ground disturbance and changes in the visual character of the area. It differs from the Proposed Action and Alternative 3 in the location of the Operations Center and associated support buildings on

the ridge. In this alternative, the Operations Center would be located farther north on the ridge near the existing visitor kiosk and closer to South Baldy Peak. Like Alternative 1 it also includes an Interferometer Support Facility.

All three utility options described in the FEIS were considered. No preferred Utility Option was identified. While the location of some facilities would differ, the construction process and operational phase under this alternative would be the same as all other alternatives except Alternative 2. See page 2-18 of the FEIS for a full description of the facilities and location.

## 1.4 Public Involvement

As described in the background, the need for this action arose in 1995. A proposal to prepare a Draft EIS for the Proposed Magdalena Ridge Observatory was listed in the Federal Register through the Notice of Intent on Thursday, October 3, 2002. The NOI asked for public comment on the proposal by November 29, 2002. The proposal was provided to the public and other agencies for comment during scoping in September 2003. The Notice of Availability (NOA) was published in the Federal Register on Friday September 19, 2003. The 45-day public comment period on the Draft EIS ended November 3, 2003.

As part of the public involvement process, the Cibola National Forest and NMIMT held public tours of the proposed observatory site in November 2002, April 2003 and October 2003. The Cibola National Forest also held Public Open Houses on November 13, 2002 in Magdalena, November 19, 2002 in Albuquerque and November 21, 2002 in Socorro. The Cibola National Forest also provided information on its web site and in the Schedule of Proposed Actions (SOPA). See pages 1-7 to 1-10 in the FEIS for more detailed information.

Considering the comments from the public, other agencies, and tribes, the interdisciplinary team identified several issues regarding the effects of the proposed action (see pages 1-10 to 1-11 in the FEIS and Appendix A and B).

The main issues included:

- Wildlife and wildlife habitat
- Ground disturbance
- Changes in visual quality
- Access for recreation
- Safety during construction
- Water use

To address these concerns, the Forest Service developed the alternatives previously described.

## 1.5 Findings Required by Other Laws and Regulations

This decision to implement Alternative 3 and Utility Option 3 is consistent with the intent of the Cibola National Forest Land and Resource Management Plans, as amended, long term goals and objectives listed on pages 3-1 to 3-4 of the FEIS. The project was designed in conformance with the Forest Plan standards and incorporates appropriate Forest Plan guidelines for Management Areas 7, 12, 13 and 16. The majority of the project area lies within Management Area 7. The specific direction for this management area and associated analysis area can be found on pages 3-2 to 3-4 of the FEIS. Information can also be found on pages 109-116 of the Cibola National Forest Land and Resource Management Plan, as amended. Other laws and Regulations include, but are not limited to:

- National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [U.S.C.] 4321 *et seq.*)
- National Forest Management Act (NFMA) (16 USC 1600 *et seq.*)
- EO 12898, Environmental Justice
- Americans with Disabilities Act (ADA)
- 1985 Cibola National Forest Land and Resource Management Plan, as amended (LRMP) as outlined in NFMA 16 USC 1604(i).
- Clean Water Act (CWA) of 1977 (33 U.S.C. 1251 *et seq.*)
- State Water Quality Standards.
- Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, as amended)
- National Historic Preservation Act of 1966 (16 U.S.C. 470)

## 2.0 Implementation

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### 2.1 Implementation Date

If no appeals are filed within the 45-day time period, implementation of the decision may occur on, but not before, 5 business days from the close of the appeal filing period. Therefore, this project will be implemented on February 2, 2004. When appeals are filed, implementation may occur on, but not before, the 15<sup>th</sup> business day following the date of the last appeal disposition.

### 2.2 Administrative Review or Appeal Opportunities

This decision is subject to administrative review (appeal) pursuant to 36 CFR Part 215. The appeal must be filed (regular mail, fax, email, hand-delivery, or express delivery) with the Appeal Deciding Officer. Written appeals must be submitted to: Appeal Deciding Officer, 333 Broadway Ave. SE, Albuquerque, NM 87102, Fax 505-842-3800.

The office business hours for those submitting hand-delivered appeals are: 8:00 – 4:30, Monday through Friday, excluding holidays. Electronic comments must be submitted in one of the following email message formats: plain text (.txt), rich text format (.rtf), and/or Word (.doc) to [appeals-southwestern-regional-office@fs.fed.us](mailto:appeals-southwestern-regional-office@fs.fed.us).

**The appeal must have an identifiable name attached or verification of identity will be required. A scanned signature may serve as verification on electronic appeals.**

Appeals, including attachments, must be filed within 45 days from the publication date of this notice in the Albuquerque Journal, the newspaper of record. The publication date in the Albuquerque Journal, is the exclusive means for calculating the time to file an appeal. Those wishing to appeal this decision should not rely upon dates or time frame information provided by any other source.

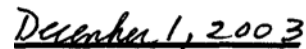
Individuals or organizations who submitted substantive comments during the comment period specified in 36 CFR 215.6, may appeal this decision. The notice of appeal must meet the appeal content requirements outlined in 36 CFR 215.14.

## **2.3 Contact Person**

For additional information concerning this decision contact Dennis Aldridge, Magdalena District Ranger, Magdalena Ranger District P.O. Box 45, Magdalena, NM 87825, 505-854-2281, TTY 505-854-2281. For information on the Forest Service appeal process, contact Cindy Correll, Cibola National Forest Planning Staff, 2113 Osuna Road NE, suite A, Albuquerque, NM 87113-1001, 505-346-3900, Fax 505-346-3901, TTY 505-346-3900.



**Liz Agpaoa  
Cibola National Forest  
Forest Supervisor**



**DATE**

## APPENDIX A: MITIGATION MEASURES AND MONITORING REQUIREMENTS

Resource	Mitigation Measure	Monitoring <sup>2</sup>			Alternatives
		I	E	V	
<b>Geology &amp; Soils</b>	Limit equipment and vehicle use on steep slopes (construction) (25.17 <sup>1</sup> ).				1, 3, 4
	Use mechanical and vegetative surface stabilization measures to prevent on-site soil loss from exposed cut slopes, fill slopes, and disposal areas (construction) (41.12 <sup>1</sup> ).	✓			1, 3, 4
	Develop and implement a Revegetation Plan coordinating with the Forest Service. All disturbed areas would be reseeded with appropriate native vegetation seed mixes. The plan would also address long-term post construction monitoring to ensure success of the revegetation effort (pre-construction, construction, post-construction) (25.18 <sup>1</sup> ).	✓	✓		1, 3, 4
	Develop an Erosion Control Plan using a combination of appropriate specification and practices (pre-construction) (41.12 <sup>1</sup> ).	✓	✓		1, 3, 4
	After heavy thunderstorms, erosion control devices should be checked to make sure they are functioning and appropriate action taken to repair or revise (construction).				1, 3, 4
<b>Water Resources</b>	Incorporate mitigating measures into project plans and designs to maintain the hydrologic and biologic function of the wetlands (25.12 <sup>1</sup> ).	✓	✓		1, 3, 4
	Monitor water use in East Fork of Sawmill Canyon Creek	✓		✓	1, 3, 4
<b>Wildlife</b>	Work during daylight hours only (construction).	✓			1, 2, 3, 4
	When possible, perform road repair and maintenance projects in PAC areas in less sensitive months (July through March) (construction, post-construction).	✓			1, 2, 3, 4
	Limit road maintenance and repair in PAC areas to hours between 2 hours after sunrise and 2 hours before sunset during the breeding and rearing season (March through August) (construction, post-construction).	✓			1, 2, 3, 4
	Install sound-insulating housing around new pump/motor at water source location (Sawmill Canyon option) (construction, post-construction).	✓			1, 3, 4
	Dig and excavate by hand in the Baldy Spring PAC (construction, post construction).	✓			1, 3, 4
	Install water line and pump in months outside the breeding season for owls (and use alternate temporary water supply sources until new source can be developed and utilized) (construction, post construction).	✓			1, 3, 4

Resource	Mitigation Measure	Monitoring <sup>2</sup>			Alternatives
		I	E	V	
	Avoid blasting or use of pneumatic charge drilling (construction).				1, 3, 4
	Monitor traffic levels on Water Canyon Road to estimate increases in noise levels along the road that may affect wildlife (particularly bird species) in the long term (construction, post-construction).				1, 3, 4
	Add provision in construction contracts requiring adherence to speed limits and no loose materials on truck beds to reduce noise levels from construction.				1, 3, 4
<b>Visual Resources</b>	Paint project structures in natural non-reflective colors. Apply non-reflective coatings to glazing that is visible beyond the project boundary (construction).	✓	✓		1, 3, 4
	Develop and implement a Revegetation Plan. All disturbed areas would be reseeded with appropriate native vegetation seed mixes. The plan would also address long-term post construction monitoring to ensure success of the revegetation effort (pre-construction, construction, post-construction).				1, 3, 4
	Crush rocks from excavated areas on the ridge and use on-site for reconstructing roads and constructing graveled parking areas. Use materials for resurfacing or mixing with concrete (construction).				1, 3, 4
	Cut all stumps to 6 inches (0.15 m) or less with cuts facing away from roads and development (construction).	✓			1, 3, 4

Notes: (1) FSH 2509.22 – Soil and Water Conservation Practices Handbook. 1990. USDA Forest Service, Region 3.

(2) I = Implementation E = Effectiveness V = Validation